Application No.: 09/974,581 Docket No.: JCLA7934

AMENDMENT

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (previously presented) An iterative method for blind deconvolution using an equalizer in a communications receiver for estimating one of users' symbol sequences ($u_j[n]$, j = 1, 2, ..., K), the method at each iteration comprising the steps of:

updating the equalizer coefficients $\mathbf{v}_I$ at the Ith iteration using the following equation:

$$\mathbf{v}_I = \frac{\alpha \cdot \tilde{R}^{-1}\tilde{d}_{I-1}}{\sqrt{\tilde{d}_{I-1}^H \tilde{R}^{-1}\tilde{d}_{I-1}}};$$

determining the associated equalizer output $e_I[n]$; and

comparing inverse filter criteria $J_{p,q}(\mathbf{v}_I)$ with $J_{p,q}(\mathbf{v}_{I-1})$ and if $J_{p,q}(\mathbf{v}_I) > J_{p,q}(\mathbf{v}_{I-1})$, going to the next iteration, otherwise updating $\mathbf{v}_I$ through a gradient type optimization algorithm so that $J_{p,q}(\mathbf{v}_I) > J_{p,q}(\mathbf{v}_{I-1})$ and then obtaining the associated $e_I[n]$;

wherein $\tilde{R}$ is a expected value, $\tilde{d}$ is a cumulation, α is a scale factor, and p,q are nonnegative integers.

Claim 2 (currently amended) The method of claim 1, further comprising a step of using a threshold decision to detect a user's symbol sequence associated with the obtained symbol sequence estimate [[{]] $\hat{u}_l[n]$= $e_I[n]$ (where l is unknown, and $e_I[n]$ is an equalizer output)[[}]] in case of converge.

Claim 3 (previously presented) The method of claim 1, which further utilizes a multistage successive cancellation (MSC) procedure, at each stage comprising the steps of:

obtaining a symbol sequence estimate $\hat{u}_l[n] = e_l[n]$ (where l is unknown);

determining the associated channel estimate of the obtained symbol sequence $\hat{u}_l[n]$ by

$$\hat{\mathbf{h}}_l[k] = \frac{E[\mathbf{x}[n+k]\hat{u}_l^*[n]]}{E[|\hat{u}_l[n]|^2]}$$

wherein $\hat{\mathbf{h}}_l[k]$ is the channel estimate; and

updating $\mathbf{x}[n]$ by $\mathbf{x}[n] - \hat{\mathbf{h}}_l[n] * \hat{u}_l[n]$, wherein x[n] is non-Gaussian vector output measurements.

Claim 4 (previously presented) The method of claim 3, which further comprises a step of using a threshold decision to detect a user's symbol sequence associated with $\hat{u}_l[n]$ at each stage of the MSC procedure.

Claim 5 (previously presented) A method for iterative blind deconvolution using an equalizer in a communications receiver of a multi-input multi-output (MIMO) system, for estimating one of users' symbol sequences ($u_j[n]$, j = 1, 2, ..., K), the method comprising the steps of:

updating equalizer coefficients;

determining if an Inverse Filter Criteria (IFC) value in a current iteration is larger than that obtained in a previous iteration and if so proceeding to the next iteration, otherwise updating the equalizer coefficients to increase the IFC value;

determining an equalizer, and an estimate of driving inputs to the MIMO system; and

detecting an estimation of the user's symbol sequence by a detection threshold.

Claim 6 (previously presented) The method of claim 5, wherein the equalizer coefficients are obtained utilizing the following formula:

$$\mathbf{v}_I = \frac{\alpha \cdot \tilde{R}^{-1}\tilde{d}_{I-1}}{\sqrt{\tilde{d}_{I-1}^{H}\tilde{R}^{-1}\tilde{d}_{I-1}}}$$

wherein $\tilde{R}$ is a expected value , $\tilde{d}$ is a cumulation, α is a scale factor, and v_I is the equalizer coefficient.

Claim 7 (currently amended) The method of claim 5, wherein the threshold decision is used to detect the user's symbol sequence associated with the obtained symbol sequence estimate [[(]] $\hat{u}_l[n] = e_l[n]$ (where l is unknown, and $e_l[n]$ is an equalizer output at the Ith iteration)[[)]] in case of converge.

Claim 8 (previously presented) The method of claim 5, which further utilizes a multistage successive cancellation (MSC) procedure, at each stage comprising the steps of:

obtaining a symbol sequence estimate $\hat{u}_l[n] = e_l[n]$ (where l is unknown), wherein $e_l[n]$ is an equalizer output at the Ith iteration;

determining an associated channel estimate of the obtained symbol sequence by

$$\hat{\mathbf{h}}_l[k] = \frac{E[\mathbf{x}[n+k]\hat{u}_l^*[n]]}{E[|\hat{u}_l[n]|^2]}$$

wherein $\hat{\mathbf{h}}_l[k]$ is the channel estimate; and

updating $\mathbf{x}[n]$ by $\mathbf{x}[n] - \hat{\mathbf{h}}_l[n] * \hat{u}_l[n]$, wherein $\mathbf{x}[n]$ is non-Gaussian vector output measurements.

Claim 9 (previously presented) The method of claim 8, wherein the threshold decision is used to detect the user's symbol sequence associated with $\hat{u}_l[n]$ at each stage of the MCS procedure.